

M-ESR-F-00158
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Revision 0

**TANK 5 SOLIDS VOLUME ESTIMATION AFTER THE SECOND CHEMICAL
CLEANING (U)**

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Tank 5 Solids Mapping Sketches
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Purpose

The purpose of this report is to document the mapping of remaining solids in Waste Tank 5 after completion of the transfer from Tank 5 to Tank 7, following the second stage of Chemical Cleaning.

Background

Beginning on August 18 seven tanker trucks of 8 weight % oxalic acid were added into Tank 5. The 7th and final tanker was added on August 20 bringing the liquid level of Tank 5 to 14.7 inches. For more information on the acid addition see LWO-LWE-2008-00283 Tank 5 Second Acid Strike Chemical Cleaning Report.

The SMPs located in Tank 5 were not operated during this phase of cleaning. The Tank 5 to Tank 7 transfer began at 23:30 on October 10. Tank 5 to Tank 7 transfer ended at 04:00 on October 11. The final observed liquid level was 2.0 inches per visual inspection and radar reading. During the pump down of Tank 5, exposed solids mounds were observed and mapped. (Attachment A)

Solids Mound Mapping

The mapping of the solids was performed by monitoring Tank 5 during the transfer with 2 cameras. Cameras were installed in Risers 2 and 7. During completion of the transfer, final tank levels were determined by tank inspection using landmarks and radar. As mounds appeared, they were mapped on sheets of paper with a scaled grid across the tank area (Attachment B). The in-tank cooling coils, tank columns, SMP columns, and the transfer pump sleeve were used as reference points to estimate exposed solids mound areas as accurately as possible.

Solids Mapping Calculation Method

The exposed mound area and height are inputs in a spreadsheet to calculate the volume of the wet solids left in the tank. The data is charted in a spreadsheet to obtain a 3-D picture of the tank bottom and the mounds.

The solids mounds appeared to have dropped in height and significantly spread out while soaking in the oxalic acid. The Northwest mound's highest point fell from 22 to 16 inches while merging with a smaller mound south of it, and spreading eastward towards the camera located in Riser 2. The Southeast mound also appeared to have shifted eastward while spreading out and dropping.

The estimated tank wide solids layer underneath the liquid surface remained at 0.25 inches. This estimation was based on camera inspection of well-lit areas of the tank where fine detail of the tank floor was observed. Landmarks include the hex nuts on the column bases, and the weld fixing the angled horizontal coil supports to the floor.

Based on the tank wide solids layer and the mapping of the observed mounds the remaining solid material volume calculated by the spreadsheet is 3,592 gallons. This is an increase in volume from 2,745 gallons recorded after the First Chemical Cleaning phase. This can be explained by the creation of oxalates during the chemical reaction, which increased the volume of the solids mounds.

Summary

Using the solids mapping calculation, it is estimated that approximately 3,592 gallons of solid material remain in Tank 5. The estimated solids volume before the Second Chemical Cleaning was 2,745 gallons per M-ESR-F-00150. A graph of the remaining solids after each cleaning phase is included as attachment C.

References

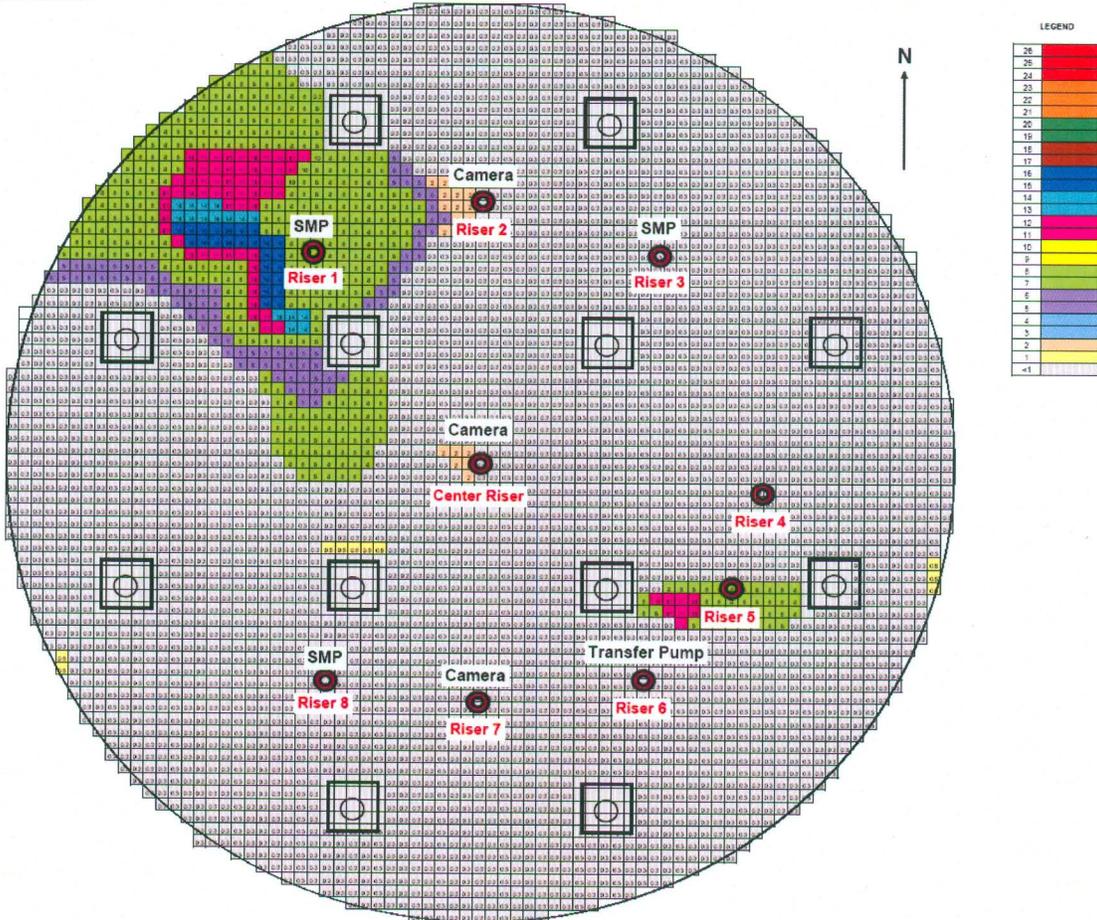
1. M-ESR-F-00150, Tank 5 Solids Volume Estimation After The First Chemical Cleaning
2. LWO-LWE-2008-00283, Tank 5 Second Acid Strike chemical Cleaning Report

Attachment A

Solids Map – Plain View

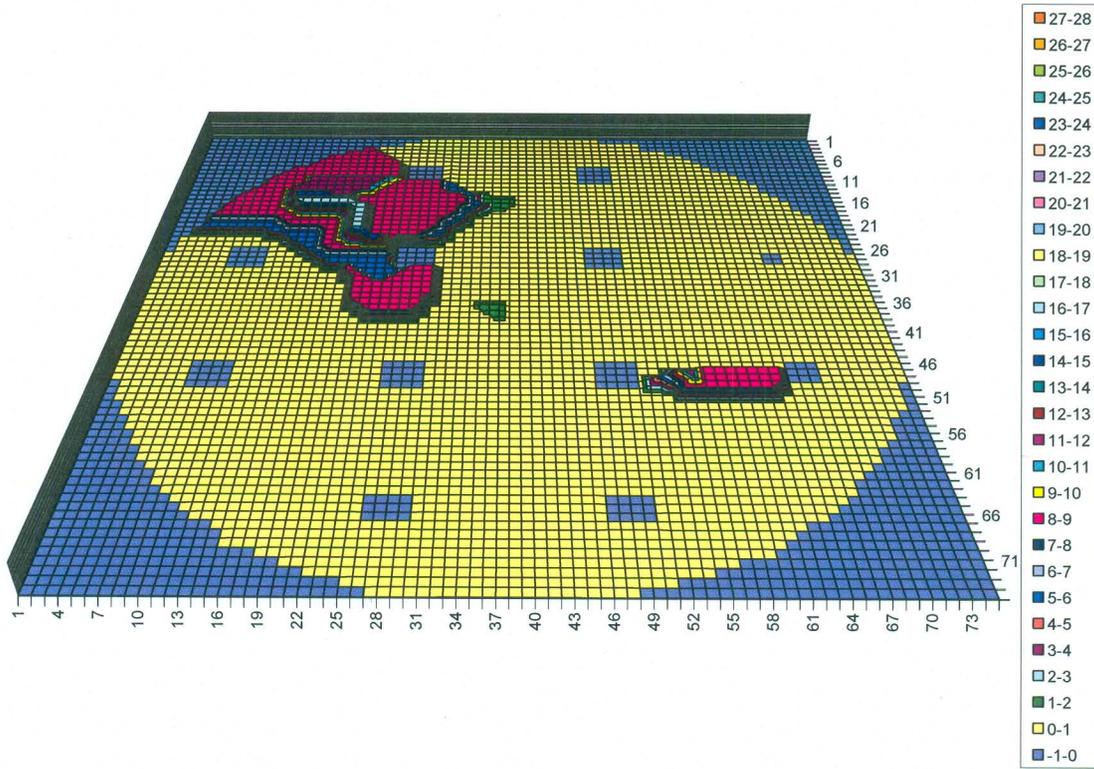
Tank 5
10/11/2008

Tank 5 Phase 2 Chem



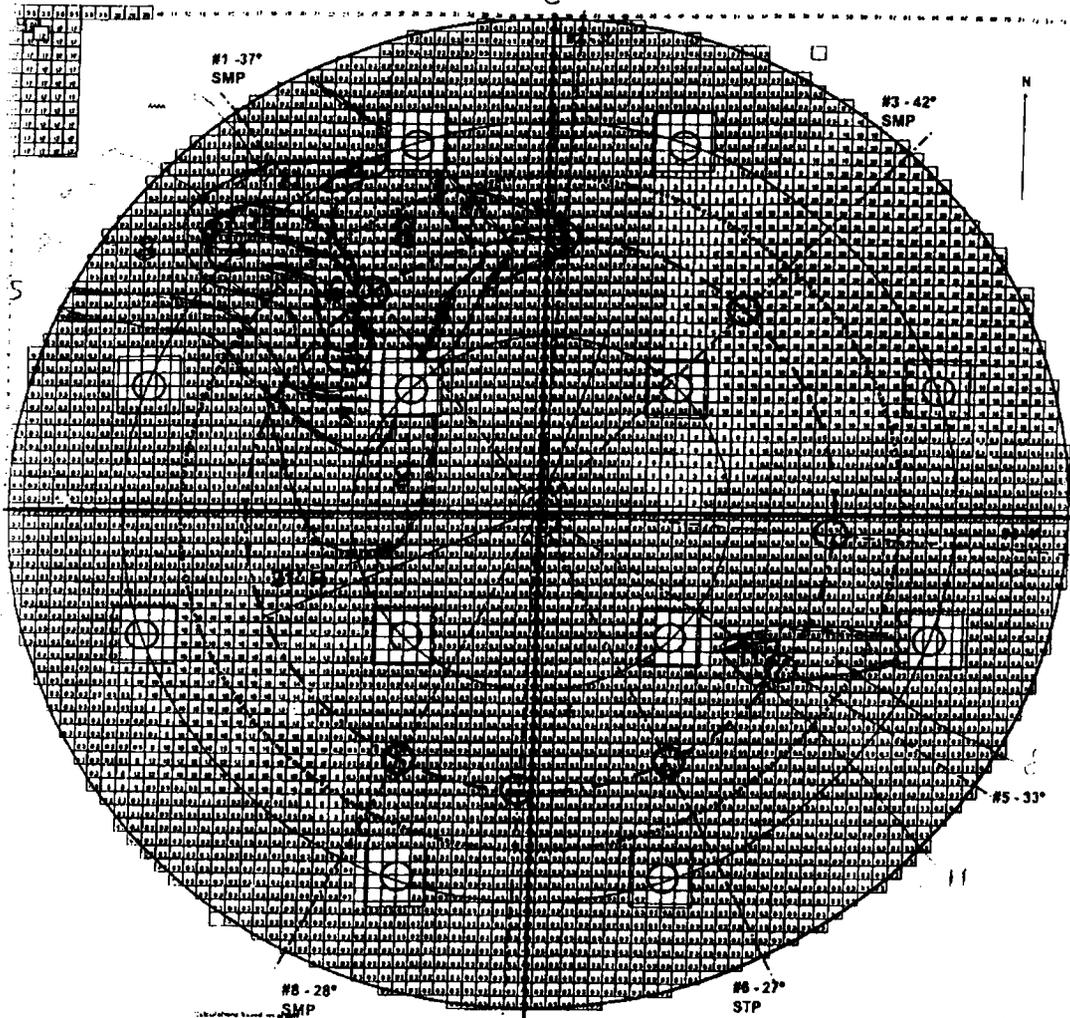
Attachment A

Solids Map – 3 Dimensional View



Attachment B

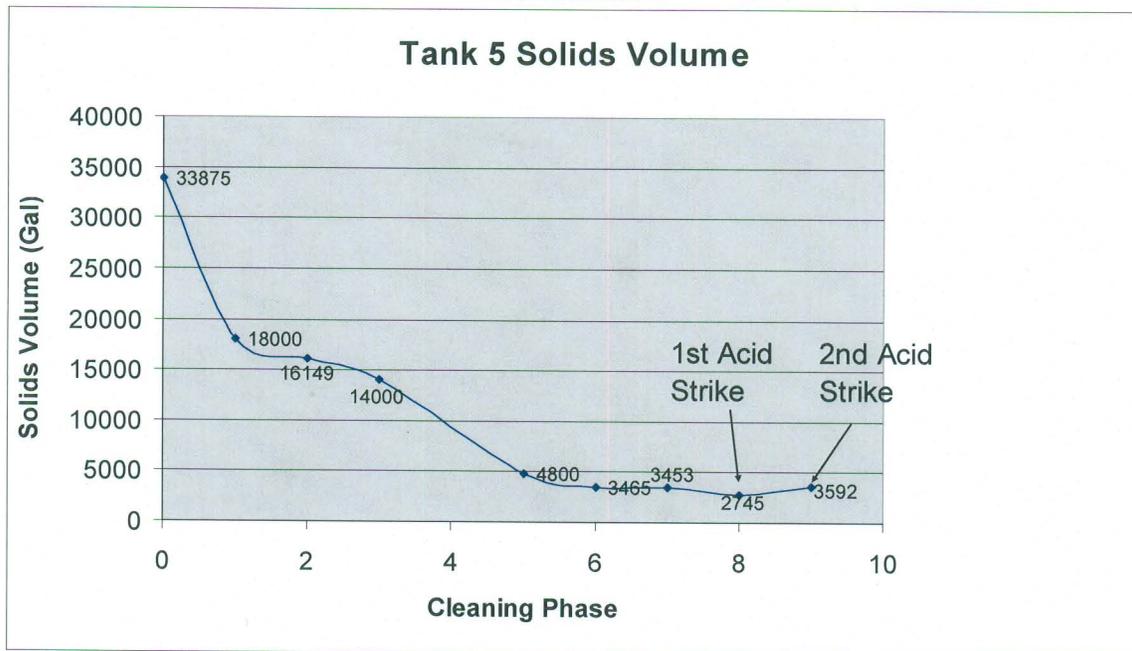
Tank 5
10/10/08



ODD NO. TANKS - 1, 3, 5, 7, 9, AND 11

Color	Value
White	0.0
Light Gray	0.1
Medium Gray	0.2
Dark Gray	0.3
Black	0.4
White	0.5
Light Gray	0.6
Medium Gray	0.7
Dark Gray	0.8
Black	0.9
White	1.0

Attachment C



Distribution

R. Boisvert	704-26F
J. Cantrell	704 26H
N. Chapman	704 70F
V. Chander	704 70F
V. Cordaro	704 70F
N. Davis	766H
M. Harrell	241 108F
J. Herbert	241 108F
M. Hubbard	241 162H
W. Isom	704 26F
R. Jolly	704 70F
D. Little	766H
B. Martin	766H
S. Middleton	704S
L. Minor	241 100F
S. Nicholson	704 26F
K. Parkinson	703H
J. Purohit	704 71F
R. Salmon	704 26F
W. Stephens	704 26F
L. White	704 26F